

REMARKS

Claims 19-72 were pending in the application. Claims 19-45 have been allowed. Applicant has amended claims 46, 49-51, 53 and 54, 57, 60, 61, 69, and 72 and added new claims 73-76 in this amendment. In making the amendments and adding the new claims, Applicant has added no new matter. Support for the amendments and new claims above can be found in the specification and claims of the application as filed.


Conclusion

Applicant respectfully submits that all pending claims 19-76 are allowable. Applicant respectfully solicits the issuance of a Notice of Allowance for all claims.

Should the Examiner have any comments, questions or suggestions of a nature necessary to expedite the prosecution of the application, he is courteously requested to telephone the undersigned at the number listed below.

Respectfully submitted,

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Version With Markings To Show Changes Made

Amendments in the Claims:

In accordance with 37 CFR § 1.121(b), the following replacement claims show all the changes made by the foregoing amendments relative to the previous versions of the claims. Material added is shown in underlined text, material deleted is shown in [brackets].

46. (Amended) A system comprising:

[a manipulandum;]

a force-feedback actuator coupled to [said]a manipulandum;

a position sensor coupled to said manipulandum;

a memory comprising a stored force feedback effect; and

a [computer-mediated] controller coupled to said force-feedback actuator, said position sensor, and said memory, wherein said [computer-mediated] controller is operable to:

[receive input information through a communication port of said computer-mediated controller and decodes commands from said input information,

read force values from said communication port,

output data on said communication port, said output data including position data from said position sensor,]

[determine a calculated]calculate a force feedback effect to contribute to output of said force feedback [system]actuator, wherein said force feedback effect comprises a force feedback effect type and a magnitude

[process said stored force feedback effect to determine a force contribution from said stored force feedback effect, and

output a force feedback value based on said determined force contribution to said force feedback actuator].

49. (Amended) A system as recited in claim [46]73, wherein said memory comprises a plurality of stored force feedback effects and said force feedback value comprises the sum of force contributions from said plurality of stored force feedback effects.

50. (Amended) A system as recited in claim 46, wherein said controller is further operable to utilize a plurality of pointers to determine the force feedback effect to contribute to said output force feedback value.

51. (Amended) A system as recited in claim 46, wherein said [computer-mediated] controller is further operable to:

compute[s] a manipulandum velocity from said position data; and
incorporate[s] said velocity in said determination of said force contribution.

53. (Amended) A system as recited in claim [52]46, further comprising a button coupled to said manipulandum and said [computer-mediated] controller.

54. (Amended) A device comprising:

a manipulandum having at least one degree of freedom[of];

an actuator coupled to said manipulandum;

a position sensor for determining a position of said manipulandum in said at least one degree of freedom; and

a [computer-mediated] controller coupled to said actuator and to said position sensor, wherein said controller is operable to:

[receive input information through a communication port of said [computer-mediated] controller and decodes commands from said input information,

read force values from said communication port,

output data on said communication port, said output data including position data from said position sensor,]

determine at least one [installed]stored force feedback effect to contribute to output of said force feedback system, wherein said force feedback effect comprises a force feedback effect type and a magnitude

[process said installed force feedback effect to determine a force contribution from said installed force feedback effect, and

output a force feedback value based on said determined force contribution to cause a force based on said force feedback value to be output by said actuator to the user of said force feedback system].

57. (Amended) A device as recited in claim 54, further comprising a gear transmission [provided]coupled between said manipulandum and said actuator, said gear transmission configured to transmit[ting] [said] an output force[s] from said actuator to said manipulandum.

60. (Amended) A device as recited in claim 54, wherein said stored force feedback effect comprises at least one of a detent, a wall, and a spring.

61. (Amended) A device as recited in claim 54, wherein said stored force feedback effect comprises an attribute, wherein said attribute comprises an attribute selected from group consisting of a stiffness attribute, a damping attribute, a force attribute, and a distance attribute.

64. (Amended) A method as recited in claim 62, wherein said maximum peak force [has]comprises about twice as great a magnitude as said nominal peak force.

69. (Amended) A device as recited in claim 68, wherein said maximum peak force is output only [when the user initially moves the]during an initial movement of said manipulandum into an object simulated in the computer graphical simulation.

72. (Amended) A device as recited in claim 68, wherein said manipulandum comprises a joystick.

73. (New) A system as recited in claim 46, wherein said controller is further operable to output a force feedback value based on said determined force contribution to said force feedback actuator.

74. (New) A system as recited in claim 46, wherein said controller is further operable to:

receive input information through a communication port of said controller and decodes commands from said input information,
read force values from said communication port, and
output data on said communication port, said output data including position data from said position sensor.

75. (New) A device as recited in claim 54, wherein said controller is further operable to output a force feedback value based on said determined force contribution to cause a force based on said force feedback value to be output by said actuator.

76. (New) A device as recited in claim 54, wherein said controller is further operable to:
receive input information through a communication port of said controller and decodes commands from said input information,
read force values from said communication port, and
output data on said communication port, said output data including position data from said position sensor.